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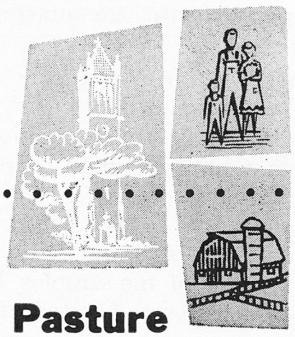
Your Experiment Station Reports

Iowa Farm Science Editorial Board

YOUR EXPERIMENT STATION REPORTS . . . . . .



Hay and Pasture

Test Forage Grasses To Improve Varieties

PIPER SUDANGRASS was the leading variety in a 1956 test of eight sudangrasses conducted by R. R. Kalton of the Experiment Station as part of a study on improving forage grasses. Piper produced 2.35 tons of dry matter per acre from three clippings from July to September.

Continued drouth reduced forage and seed production in many tests of forage grass breeding material. Drouth also ruined several new nurseries planted to determine the performance of a number of promising *orchardgrass* synthetic varieties. In spite of the drouth damage, preliminary results indicated that several of the new Iowa orchardgrass synthetics may be supperior to commercial strains now available in vigor of growth, establishment ability and drouth resistance.

Though presently of primary value for wetland areas and erosion control, *reed canarygrass* again proved to be outstanding in drouth resistance compared with many other cool-season grasses.

A number of seed collections of reed canarygrass from diverse origins were evaluated for forage and seed production, seed and forage quality, recovery and shattering resistance in several types of plantings. Differences in forage production with repeated clipping in solid stands were small. However, production and recovery of a number of strains were about as good as bromegrass and orchardgrass check plots. Of over 5,000 spaced reed canarygrass plants observed, only a few appeared to have some promising resistance to seed shattering. Wide differences among plants in leafiness, vigor, recovery and disease resistance, however, indicate good possibilities for breeding a better strain of reed canarygrass.

Foundation seed stocks of Fischer bromegrass, Ioreed canarygrass and several new orchardgrass synthetics have been produced at Ames and Cresco for testing purposes and for further seed increase.

Iowa Alfalfa Acreage Doubled From '49 to '56

THE ACREAGE of alfalfa and alfalfa mixtures in Iowa has increased from about 1 million acres in 1949 to more than 2 million acres in 1956, reports C. P. Wilsie of the Experiment Station. An important reason for this rapid increase has been the dependable supply of high-quality seed of improved varieties available in the last few years.

To assure continued improvement and supply of high-quality seed, the Iowa Agricultural Experiment Station, in cooperation with the USDA, maintains a long-term study on the evaluation of varieties, strains and breeding material of alfalfa—as well as other legumes.

In 1956 variety trials in the field, Vernal, Buffalo and Ranger have been superior in yield over other commercial varieties under central Iowa conditions. A new synthetic variety—Iowa 2187—has shown promising results in a 3-year trial. Vernal also has shown outstanding performance under frequent cutting, as well as under a regular hay cutting system of management.

The invasion of the spotted alfalfa aphid from the southwest has focused attention on a new problem in the alfalfa breeding studies. Crosses have been made using aphid-resistant clones from Nevada and outstanding Iowa selections as parental material. These will be tested in the field at the first opportunity.

Granular Insecticides Control Clover Weevil

SWEETCLOVER WEEVIL can be effectively controlled by mixing granular insecticide (dieldrin or heptachlor) with the seed. This conclusion is based on results of experiments conducted by J. H. Lilly of the Iowa Agricultural Experiment Station. However, warns Lilly, in using granular insecticides care should be taken in choosing a carrier suitable to your equipment and operations. Where endgate seeders are used, No. 4 Vermiculite is too light a granular carrier to be distributed satisfactorily either alone or mixed with the seed.

Insecticide Residue On Alfalfa Studied

SEVERAL INSECTICIDES are being used successfully to control destructive insects on forage crops such as alfalfa. Important considerations in developing a new chemical for such use include the rate of disappearance and chemical identity of its residues.

In cooperation with the American Cyanamid Company, workers at the Experiment Station tested the systemic insecticide, Thimet, under various conditions in 1956. The number of insects in the treated fields was noticeably reduced immediately after spraying, and in most cases this reduction lasted for at least 2 or 3 weeks. A 45-percent greater hay yield was obtained from one of the Thimet-sprayed fields

as compared with an untreated field in the same vicinity.

Though each area of alfalfa was sprayed and sampled for residue analyses under different conditions, there was a similar pattern of residue disappearance in all of the treated plots and fields. After 21 days there were still some residue toxins in a few of the samples, but no toxins were ever detected after 28 days.

Future plans call for feeding a quantity of baled Thimet-treated and untreated alfalfa to dairy cows to learn the effects of feeding the insecticide-treated hay. P. A. Dahm, E. N. Sundar, D. V. Sisson and J. H. Lilly are conducting these studies.

Seek Grasses, Legumes For Highway Backslopes

CHOOSING THE best species and varieties to plant for protective vegetative cover on highway backslopes is the goal of a study by J. M. Aikman, W. D. Shrader, Robert Scannell, Frank Kulfinski and Paul Peperzak. The Iowa Highway Commission is cooperating with the Iowa Agricultural Experiment Station in this study.

In trials planted in 1954 south of Leon on Highway 69, intermediate wheatgrass produced a much greater stand and yield than did timothy, smooth brome, big bluestem mixture or little bluestem mixture. Application of fertilizer doubled the stand of intermediate wheatgrass by 1956. Birdsfoot trefoil, like most of the grasses, was poor in stand and yield. Of the alfalfas planted, Vernal and Nomad produced more dense stands than Ranger. With fertilization, Vernal produced a three-fold stand increase.

Plantings in 1955 west of LeGrand on Highway 30 and west of West Des Moines on Highway 90 showed that a mixture of brome and intermediate wheatgrass survived better than a mixture of timothy and creeping red fescue or one of alta fescue and Kentucky bluegrass. Fertilizers increased growth and aided in seedling establishment when the cover crop was thin or clipped.

On Highway 37 northeast of Dunlap and on Highway 20 west of Moville, big and little bluestems, sideoats grama and switchgrass produced the best stands. At these locations, intermediate wheatgrass, crested wheatgrass, creeping red fescue and other grasses in the native grass mixtures produced relatively poor stands.

Preliminary trials in southern Iowa in 1956 indicate that Korean lespedeza has potential usefulness for highway backslopes on these soils.

Get Increased Yields From Improved Pasture

IMPROVED PERMANENT pastures continue to outyield unimproved pastures by a wide margin as shown in long-term Experiment Station studies at the Pasture Improvement Farm at Albia. In 1956 trials, cattle rotationally grazed on improved alfalfa pasture showed an average daily gain of 2.15 pounds as compared with an average daily gain of 1.83 pounds for cattle grazed on unimproved pasture.

Both alfalfa and birdsfoot trefoil seedings were studied for improved pastures. Alfalfa was more productive than trefoil. Of the trefoils, Empire maintained a more vigorous, dense stand than did Viking in the short period of time that these varieties were studied. Grazing type alfalfas are being compared with Ranger under continuous and rotational grazing and for hay management.

At Beaconsfield returns from pasture improvement by renovation and by the addition of phosphate fertilizer and lespedeza have been compared with unimproved pastures using beef cows and calves.

Results showed that pastures renovated and seeded without a companion crop produced as much beef in 74 days during the seeding year as did the unimproved pasture in 126 days. This indicates that land need not be considered out of production the year of renovation since the pasturage from the companion crop or from the new seeding itself usually equals or exceeds that from the unimproved pasture.

The increase from nitrogen fertilizer applied to Kentucky bluegrass in 1956 was lower than would be expected with adequate moisture. Moisture was limiting throughout the spring when response to nitrogen is greatest on cool-season grasses. Fertilizer and lime requirements for birdsfoot trefoil are also being studied, and the plots were harvested for the first time in 1956.

J. M. Scholl, H. D. Hughes, J. T. Pesek and R. M. McWilliams are the key personnel working on these studies.

Study Basic Problems In Sweetclover Breeding

RESEARCHERS at the Iowa Agricultural Experiment Station are studying fundamental problems in breeding methods of sweetclover which may have application to the improvement of other forage crops in addition to improving sweetclover.

Special emphasis is given in this study to evaluate and devise methods of breeding which may more quickly achieve desired results in uniformity of plant type, vigor of growth and production of synthetic varieties. Sweetclover plants can be effectively grown in the greenhouse during the winter months and a new seed generation produced by using honeybees for cross pollination, thus accomplishing in 1 year the same progress as would be obtained normally in two crop season. In less than 5 years' time, very uniform types have been produced through a breeding system called "recurrent" selection. This method of breeding is equally applicable to many cross-pollinated plants.

I. J. Johnson is directing these studies.

New Alfalfa Disease Reported in Iowa

BACTERIAL LEAF SPOT of alfalfa was reported in Iowa for the first time in 1956—this was also the second report of the disease in the United States. A survey conducted in September 1956 by R. D. Brigham and M. C. Shurtleff of the Experiment Station showed that the disease was present in five of six central Iowa counties. Damage to alfalfa was generally light, but susceptible lines in nursery plots were seriously defoliated and some broken stems were reported.

The extremely dry weather in 1956 lowered the prevalence of other alfalfa diseases. Spring blackstem was important in the

spring, and common leaf spot predominated during the summer. Incidence of summer blackstem was very low. Rust was prevalent in late summer and fall.

J. W. Baxter reported a type of drouth injury to alfalfa in Story and Polk counties. Plants were severely stunted after first cutting, were greyish in color, and bloomed earlier than normal. The injury occurred in well-defined areas in well-drained fields.

Diseases of other legumes in 1956 were as follows: Angular leaf spot and northern anthracnose were prevalent on red clover. Foliage blight of birdsfoot trefoil was prevalent. An unidentified species of *Ascochyta* also was isolated from diseased birdsfoot trefoil roots, and nematodes were found in diseased crowns and roots. Pepper spot and angular leaf spot were present on Ladino clover. Virus symptoms of different types also were observed on Ladino, and rust was prevalent during late summer and fall.

List 1956 Diseases Of Sweetclover

SWEETCLOVER suffered less disease damage in 1956 than in [illegible] and spring blackstem appeared in early spring but decreased with dry weather. Summer blackstem and leaf spot were present but caused little damage.

Study of a sweetclover disease caused by *Fusarium* spp. indicates that plants attacked are likely weakened by winter injury or drouth. In some cases there was only a few day's span between the appearance of symptoms and death of the plant. Also, other fungi were often found associated with the later stages of the disease.

Adapt Forage Crops To Iowa Conditions

PROMISING VARIETIES and species of alfalfa, bromegrass, timothy and red clover alone and in mixtures are tested annually at the Experiment Station's outlying soil type farms. These species and varieties are established in a crop rotation and evaluated for hay. The purpose of the tests is to seek species and varieties of forage crops adapted to soil and climate differences in Iowa.

Three-year results of a study on grass-legume mixtures have shown [illegible] drained soils in seasons when rainfall is normal, red clover may outyield alfalfa. This has been true in Howard and Buchanan counties.

Adding half a pound of Ladino clover seed per acre in alfalfa or red clover seedings reduced hay yields when the legumes were grown alone. But when alfalfa was grown with bromegrass or timothy, adding Ladino clover increased the yield of hay. Bromegrass was generally more productive than timothy in mixtures. However, at some locations this was not true.

Both imported and domestic birdsfoot trefoil were inferior to red clover and alfalfa for hay when grown in a rotation. They both started slowly when grown with oats as a companion crop and did not reach satisfactory yield levels the year after seeding. There was little difference in yield between imported and domestic birdsfoot trefoil when harvested for hay—though they were not consistently equal at all locations.

H. E. Thompson, J. M. Scholl and H. D. Hughes of the Iowa Agricultural Experiment Station are conducting these experiments.

ern Iowa, any of the varieties tested proved satisfactory for stands maintained up to 4 years when they are harvested for hay. The varieties tested were: Ranger, Buffalo, Grimm, Ladak, Kansas Common, Dakota Common, Atlantic and Narragansett.

Disease-resistant varieties have not shown definite superiority over ordinary varieties in southern Iowa since bacterial wilt has not been a problem in these trials. Buffalo, while average in yield for the 4-year period, has improved its rank each year and ranked first in 1956.

H. E. Thompson, who directed these Experiment Station trials, reports that the trials will be continued to try to determine how long it will be before diseases such as bacterial wilt thin the stands of susceptible varieties.

Alfalfa Yields High In Pasture Trials

YIELDS OF perennial forages have been compared for several years at three Iowa locations—Ringgold, Page and Howard counties—by agronomists at the Iowa Agricultural Experiment Station. The crops studied were Kentucky bluegrass, bromegrass, timothy, orchardgrass and alta fescue when grown alone or when grown in mixtures with alfalfa, Ladino clover and birdsfoot trefoil. The yields of these legumes grown alone also have been compared.

Such forages have value for pasture purposes and are evaluated by a system of frequent cuttings—a management similar to alternate grazing. Though individual results varied somewhat at different locations, in general the results for the 5-year tests, 1952-56, are as follows:

The highest yielding plots have always been those containing alfalfa or alfalfa-grass mixtures. This suggests that alfalfa, which usually does not survive for more than 2 or 3 years under continuous grazing, may be expected to last for a much longer period under an alternate system of grazing similar to this cutting management.

Birdsfoot trefoil has not been as productive as alfalfa. Good stands have been maintained at Ringgold County but yields have been reduced more than alfalfa in the dry years. At Page County, birdsfoot trefoil has been too low yielding to offer much promise on these soils. On the other hand, at Howard County, trefoil has shown a steady increase each year and on a 3-year basis is equal to Ladino when grown alone.

Ladino clover produced high yields in 1953 but had completely disappeared by 1954. However, plots that were originally Ladino-grass mixtures and have been only grass since 1953 still were showing high yields in 1956 because of the effects of the nitrogen fixed by the Ladino.

Bromegrass, orchardgrass and alta fescue have yielded about the same at two locations. However, at Howard County, bromegrass has shown a consistent slight advantage over the other grasses when grown alone or in mixtures. Timothy has not been maintained by this frequent clipping, and alta fescue has the disadvantage of being relatively unpalatable.

Yields of grasses were increased in 1956 over previous years by the application of 60 pounds of nitrogen fertilizer. This increase came in a very dry season when yields of legumes and mixtures were below the 4-year averages. At Howard County, the increased production ranged from 60 percent for bromegrass to 288 percent for Kentucky bluegrass.

Key personnel cooperating in this study of perennial pasture forages are: J. M. Scholl, H. E. Thompson and H. D. Hughes.

Adding Dry Roughage In Small Amounts Improves Grass Ration

ADDING 2 to 4 pounds of hay to full-feed of grass silage markedly improved liveweight gains over those obtained with steers not receiving hay, report W. H. Hale and J. M. Scholl of the Experiment Station. Similarly, adding 4 pounds of ground ear corn produced more rapid gains at lower feed costs than those obtained where no dry roughage was added to grass silage.

In tests to learn the value of drouth corn silage as a feed for wintering cattle, results showed that adding 2 to 4 pounds of brome-alfalfa hay to a full-feed of drouth corn silage also improved rate of gain over that obtained where no hay was fed. Eight pounds of ground ear corn added to a full-feed of drouth corn silage produced liveweight gains of 2.19 pounds per steer per day. This amount of corn was estimated to be equal to that contained in regular corn silage.

Drouth corn silage full fed without added corn in this experiment produced rates of gain greater than those usually desired for wintering steers that are to be pastured the following summer. However, the gains were below those usually expected from good corn silage.

Cooperating with Hale and Scholl in these experiments are Earl O. Heady, Wise Burroughs, R. M. McWilliams, W. D. Shrader and H. D. Hughes.

Use Certified Seed To Assure High-Quality

USING IMPROVED crop varieties is one of the best ways of getting the most for your money. In addition to choosing the best varieties to meet your needs, it's important to be sure you have high-quality seed. Seed certification programs in Iowa and other states have been developed to assure high-quality seed free of noxious weeds and other impurities. In Iowa the seed certification program is a cooperative project of the Iowa Agricultural Experiment Station and the Iowa Crop Improvement Association.

To produce certified seed, the stock which is planted must be either foundation or certified. The crop itself must be inspected in the field and meet certain definite standards. After the seed has been prepared for market—whether it be corn, sorghum, small grains, soybeans or forage crops—samples are drawn by the certifying agency to make certain that the seed is free of noxious weed seeds, is true to variety and that it will germinate satisfactorily.

Many growers in your community as well as seed companies have certified seed for sale. You can obtain a list of seed growers from your county extension office.

Joe L. Robinson, Charles D. Hutchcroft and Glenn Wassom are directing the seed certification program in Iowa.